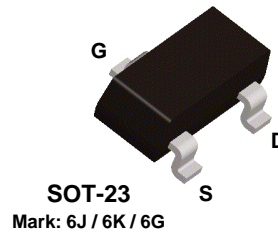
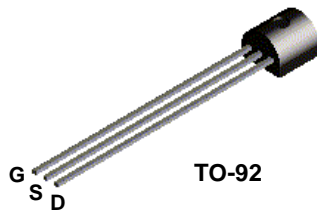


**PN4391
PN4392
PN4393**

**MMBF4391
MMBF4392
MMBF4393**



N-Channel Switch

This device is designed for low level analog switching, sample and hold circuits and chopper stabilized amplifiers. Sourced from Process 51. See J111 for characteristics.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{DG}	Drain-Gate Voltage	30	V
V _{GS}	Gate-Source Voltage	- 30	V
I _{GF}	Forward Gate Current	50	mA
T _J , T _{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max		Units
		PN4391	*MMBF4391	
P _D	Total Device Dissipation Derate above 25°C	350	225	mW
		2.8	1.8	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	125		°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	357	556	°C/W

*Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

N-Channel Switch

(continued)

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHARACTERISTICS					
$V_{(BR)GSS}$	Gate-Source Breakdown Voltage	$I_G = 1.0 \mu A, V_{DS} = 0$	- 30		V
I_{GSS}	Gate Reverse Current	$V_{GS} = 15 V, V_{DS} = 0$ $V_{GS} = 15 V, V_{DS} = 0, T_A = 150^\circ C$		- 1.0 - 0.2	nA μA
$V_{GS(off)}$	Gate-Source Cutoff Voltage	$V_{DS} = 20 V, I_D = 1.0 nA$	PN4391 PN4392 PN4393	- 4.0 - 2.0 - 0.5	V V V
$V_{GS(f)}$	Gate-Source Forward Voltage	$I_G = 1.0 mA, V_{DS} = 0$		1.0	V
$I_{D(off)}$	Drain Cutoff Leakage Current	$V_{DS} = 20 V, V_{GS} = 12 V$ PN4391 $V_{DS} = 20 V, V_{GS} = 7.0 V$ PN4392 $V_{DS} = 20 V, V_{GS} = 5.0 V$ PN4393 $V_{DS} = 20 V, V_{GS} = 12 V, T_A = 150^\circ C$ PN4391 $V_{DS} = 20 V, V_{GS} = 7.0 V, T_A = 150^\circ C$ PN4392 $V_{DS} = 20 V, V_{GS} = 5.0 V, T_A = 150^\circ C$ PN4393		0.1 0.1 0.1 0.2 0.2 0.2	nA nA nA μA μA μA
ON CHARACTERISTICS					
I_{DSS}	Zero-Gate Voltage Drain Current*	$V_{DS} = 20 V, V_{GS} = 0$	PN4391 PN4392 PN4393	50 25 5.0	150 75 30 mA mA mA
$V_{DS(on)}$	Drain-Source On Voltage	$I_D = 12 mA, V_{GS} = 0$ PN4391 $I_D = 6.0 mA, V_{GS} = 0$ PN4392 $I_D = 3.0 mA, V_{GS} = 0$ PN4393		0.4 0.4 0.4	V V V
$r_{DS(on)}$	Drain-Source On Resistance	$I_D = 1.0 mA, V_{GS} = 0$	PN4391 PN4392 PN4393	30 60 100	Ω Ω Ω
SMALL-SIGNAL CHARACTERISTICS					
$r_{ds(on)}$	Drain-Source On Resistance	$V_{DS} = V_{GS} = 0, f = 1.0 kHz$	PN4391 PN4392 PN4393	30 60 100	Ω Ω Ω
C_{iss}	Input Capacitance	$V_{DS} = 20, V_{GS} = 0, f = 1.0 MHz$		14	pF
C_{rss}	Reverse Transfer Capacitance	$V_{GS} = 12 V, f = 1.0 MHz$ PN4391 $V_{GS} = 7.0 V, f = 1.0 MHz$ PN4392 $V_{GS} = 5.0 V, f = 1.0 MHz$ PN4393		3.5 3.5 3.5	pF pF pF
SWITCHING CHARACTERISTICS					
t_r	Rise Time	$I_{D(on)} = 12 mA$ PN4391 $I_{D(on)} = 6.0 mA$ PN4392 $I_{D(on)} = 3.0 mA$ PN4393		5.0 5.0 5.0	ns ns ns
t_f	Fall Time	$V_{GS(off)} = 12 V$ PN4391 $V_{GS(off)} = 6.0 V$ PN4392 $V_{GS(off)} = 3.0 V$ PN4393		15 20 30	ns ns ns
t_{on}	Turn-On Time	$I_{D(on)} = 12 mA$ PN4391 $I_{D(on)} = 6.0 mA$ PN4392 $I_{D(on)} = 3.0 mA$ PN4393		15 15 15	ns ns ns
t_{off}	Turn-Off Time	$V_{GS(off)} = 12 V$ PN4391 $V_{GS(off)} = 6.0 V$ PN4392 $V_{GS(off)} = 3.0 V$ PN4393		20 35 50	ns ns ns

*Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 1.0\%$

PN4391 / PN4392 / PN4393 / MMBF4391 / MMBF4392 / MMBF4393